

4. FEE ADEQUACY

This analysis finds that the current 1.0 mill per kWh fee charged on generators of commercial SNF is adequate, and recommends that the fee remain unchanged. This recommendation is based on the examination and analysis of revenue forecasts and estimated costs for Cases 1 and 2 as described in the 1999 TSLCC estimate (CRWMS M&O 1999b). The NWF is projected to have a positive balance at the end of waste emplacement activities based on current program cost estimates, fee revenue projections, and independent projections of inflation and interest rates. This balance is expected to be sufficient to fund the planned program and to allow for contingencies. Ending the emplacement period with sufficient capital in the NWF will retain alternatives for future decision-makers. A NWF balance in excess of the minimum requirement provides a margin of safety for uncertainties or changes in program scope, costs, revenues, and economic assumptions.

This current assessment is based on economic assumptions that have changed significantly from the previous assessment (DOE 1998a). The real interest rate on the 10-year Treasury note used in this analysis is 3.0 percent, which is significantly higher than the 45-year historical average of 2.5 percent. Projected balances in the NWF are highly sensitive to the economy's real rate of return, approximated by the difference between the nominal interest rate and the inflation rate.

This analysis finds that even if current program cost estimates are evaluated utilizing the more conservative 1998 economic assumptions (Standard and Poor's DRI 1998), then the fee is adequate, but less so than for the Viability Assessment reference system (DOE 1998a). The changes for Case 2 have a negligible effect on adequacy because closure and decommissioning costs in distant outyears are discounted for many years. The fee is also adequate for Case 1, 50-year closure, but with less margin than in the 1998 fee adequacy analysis (DOE 1998e).

4.1 FEE ADEQUACY RESULT

This analysis finds the current 1 mill per kWh fee is adequate for the updated 1999 TSLCC (CRWMS M&O 1999b) estimate for both Cases 1 and 2. Results of this analysis for Cases 1 and 2 are presented in Figures 5 and 6. The black lines on Figures 5 and 6 represent the boundary between the Fee Adequate/Fee Not Adequate areas, for Cases 1 and 2 of Scenario 1 in Table 4, with current costs and economic assumptions. Points along the lines reflect different combinations of a percentage change in the annual inflation rate and a corresponding percentage change in the annual nominal interest rate. This results in a NWF balance equaling, in constant 1999 dollars, a target value in 2042 after the completion of waste emplacement. The target values in 2042 are \$5.3 billion for Case 1 and \$3.9 billion for Case 2.

The \$5.3 Billion and \$3.9 Billion target balances in 2042 for Cases 1 and 2 were calculated as the net present value of future costs needed to cover the monitoring, closure, and decommissioning activities in 1999 constant dollars. The discount rate for the net present value calculation for estimating the capital required in 2042 was the average nominal interest rate for the period 2043 to 2069 for Case 1 and 2043 to 2144 for Case 2, decreased by 25 percent for economic uncertainty.

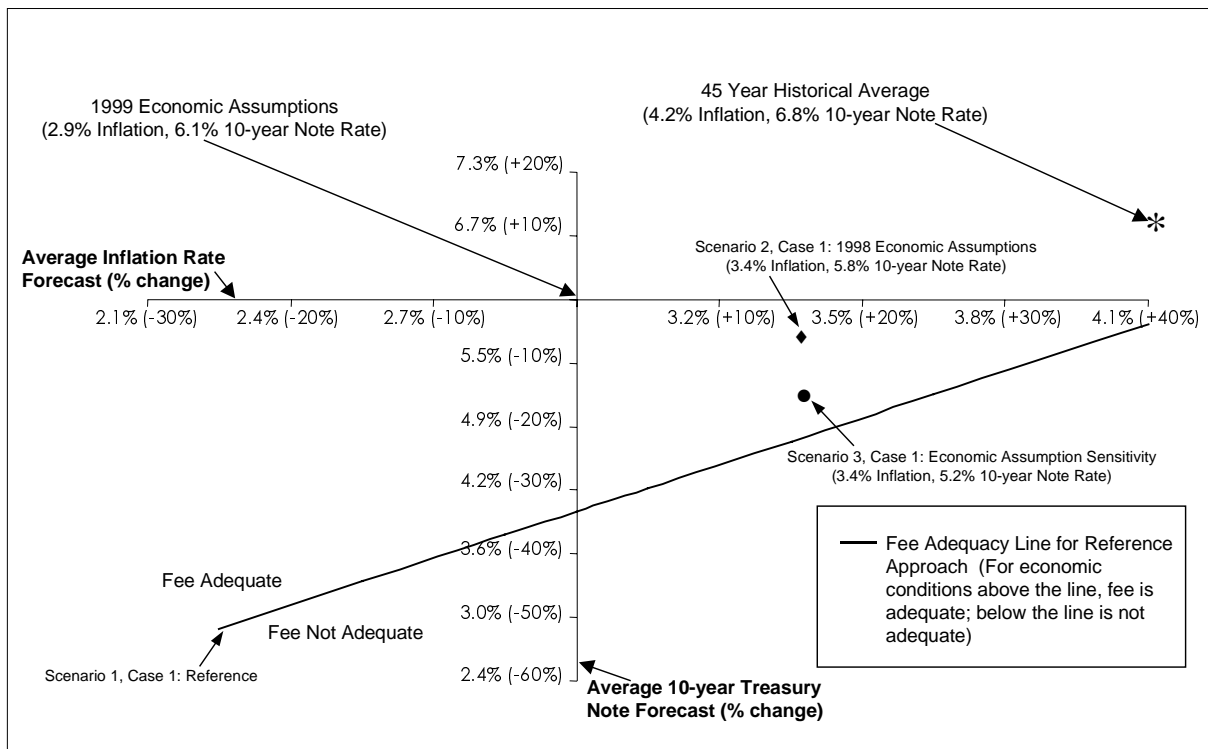


Figure 5. Case 1 Fee Adequacy: Sensitivity to Changes in Economic Assumptions with Current Program Costs

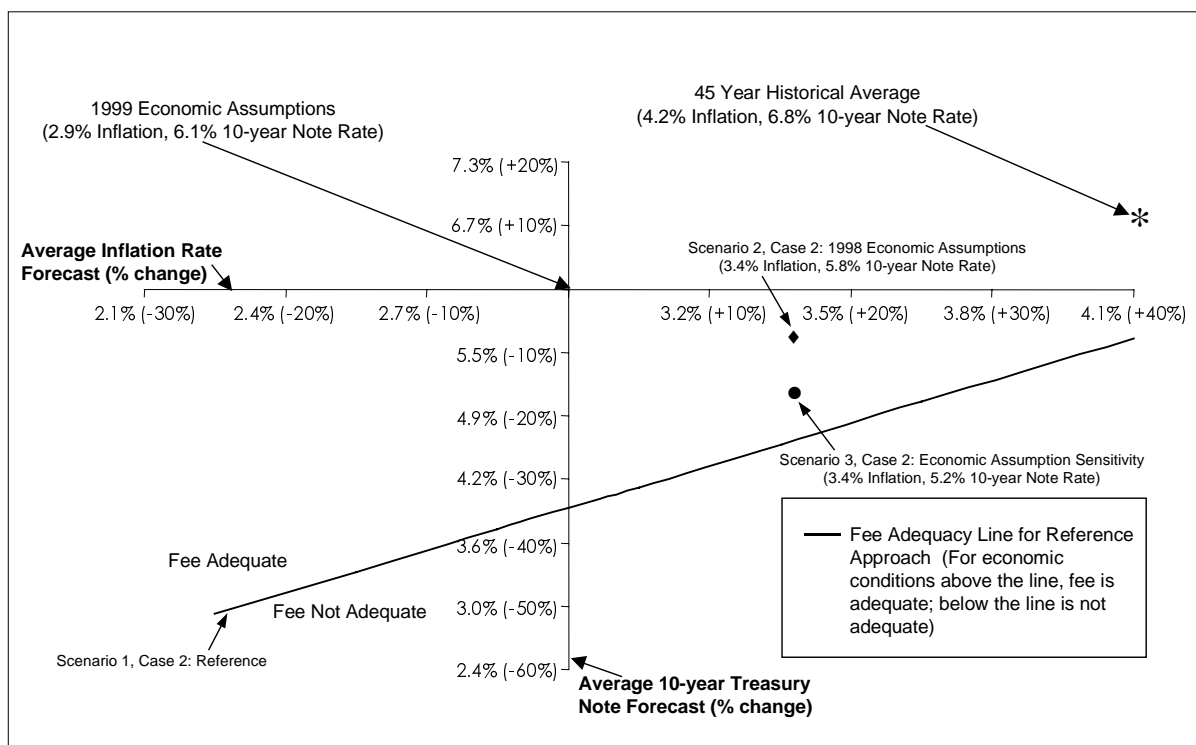


Figure 6. Case 2 Fee Adequacy: Sensitivity to Changes in Economic Assumptions with Current Program Costs

Table 4. Sensitivity Analysis on NWF Adequacy for Alternative Economic and Cost Scenarios

Scenario	Case 1		Case 2	
	NWF Balance in 2042	NWF Adequacy (Target = \$5.3 Billion)	NWF Balance in 2042	NWF Adequacy (Target = \$3.9 Billion)
1. 1999 TSLCC Reference Cost (Avg. Nominal Interest Rate = 6.1 percent, Avg. Inflation Rate = 2.9 percent)	\$23.3 Billion	Adequate	\$23.7 Billion	Adequate
2. 1999 TSLCC, using 1998 Rates (Avg. Nominal Interest Rate = 5.8 percent, Avg. Inflation Rate = 3.4 percent)	\$12.7 Billion	Adequate	\$13.0 Billion	Adequate
3. 1999 TSLCC Reference Cost with a 15 percent decrease in Nominal Interest Rate and 15 percent increase in Inflation Rate (Avg. Nominal Interest Rate = 5.2 percent, Avg. Inflation Rate = 3.4 percent)	\$8.3 Billion	Adequate	\$8.2 Billion	Adequate
4. 1999 TSLCC Reference Cost with a 20 percent Cost increase (Avg. Nominal Interest Rate = 6.1 percent, Avg. Inflation Rate = 2.9 percent)	\$14.8 Billion	Adequate	\$15.2 Billion	Adequate
5. 1999 TSLCC, using 1998 Rates and a 20 percent Cost increase (Avg. Nominal Interest Rate = 5.8 percent, Avg. Inflation Rate = 3.4 percent)	\$5.5 Billion	Adequate	\$5.8 Billion	Adequate

The slope of the lines represents the percentage increase in the inflation rate for a percent change in the 10-year Treasury note rate that keeps the program on the fee adequacy boundary. If the intersection point of the axes of percentage changes in the forecasted 10-year Treasury note rate and the CPI inflation rate falls below the line, the balance of the NWF after emplacement is too small to fund remaining projected costs. The zero intercept (center point) represents the current interest and inflation forecasts (CRWMS M&O 1999a). The asterisk in Figures 5 and 6 provides the 45-year historical average of inflation and the 10-year Treasury note rate.

4.2 FEE ADEQUACY SENSITIVITY

Fee adequacy is sensitive to changes in costs and economic assumptions. Table 4 compares the fee adequacy results of Scenario 1 with four scenarios to address the sensitivity to changes in economic assumptions and costs. Scenario 1, represented by the diagonal lines in Figures 5 and 6, is the reference system estimated for Cases 1 and 2 in the 1999 TSLCC (CRWMS M&O 1999b).

Scenario 2, depicted as a single point in Figures 5 and 6, shows the effect of the change in forecasted nominal interest and inflation rates. Between the last Fee Adequacy assessment (DOE 1998e) and this assessment, the real forecasted interest rate on 10-year Treasury notes has increased by approximately a half a percent, which is a large increase for an annual update. The real interest rate on the 10-year Treasury note used for Scenario 2 was 2.3 percent (Figure 3).

Scenario 3, depicted by a single point in Figures 5 and 6, illustrates the sensitivity of the NWF balance to changes in assumed interest and inflation rates. If the forecasted CPI inflation rate increased 15 percent and the forecasted 10-year Treasury note rate decreased 15 percent, the result would be a smaller NWF balance in 2042. The Scenario 3 NWF Balances in 2042 are 35 percent of the Scenario 1 balances for Cases 1 and 2. Under these conditions, the fee would be adequate.

Scenario 4 is represented in Figures 7 and 8 by the black lines to show the sensitivity of fee adequacy to an across-the-board 20 percent increase in estimated costs. The fee adequacy line in Figures 7 and 8 illustrates that under the current inflation forecast, the program is fee adequate with a 20 percent increase in future costs.

Scenario 5 combines the sensitivities of Scenarios 2 and 4 by using the 1998 interest and inflation rates with a 20 percent across-the-board cost increase. The results of Scenario 5, depicted as a single point in Figures 7 and 8, show that for Case 1 the fee is marginally adequate, and for Case 2 the fee is adequate. The margin for Case 1 is \$0.2 Billion, and the margin for Case 2 is \$1.9 Billion over the target NWF balances in 2042. In Figure 7, the Scenario 5 point is just above the diagonal line and is barely in the “fee adequate” region. In Figure 8, the Scenario 5 point is above the diagonal line and in the fee adequate region.

4.3 ANNUAL DATA

Table 5 provides a detailed breakout of forecasts of the 1.0 mill per kWh fee, one-time fee payments, and income from investments in the NWF for Case 1 and Case 2, using the current interest and inflation rates forecasts (CRWMS M&O 1999a). Table 5 is presented in YOE dollars, as these categories are used to assist the budget formulation process.

Table 6 provides an annual flow of the civilian cost share in constant 1999 dollars for Case 1 and Case 2. Since Tables 5 and 6 are in different units of measurement, comparisons are not appropriate. The civilian cost share is less than the calculated annual shares, prior to 2010, due to assumed repayment of prior outstanding government financial obligations, including interest, for government-managed nuclear materials. The repayment of outstanding balances offsets the civilian cost share in the early years since this receipt of funds, greater than the annual cost share, reduces the need to withdraw funds from the NWF. For a given year, the current Fund balance equals the previous year's Fund balance plus fee payments, one-time fee payments, and income from investments less the civilian cost share. However, using the data from Table 5 and Table 6, the NWF balance can not be calculated, since these tables are in different cost units.

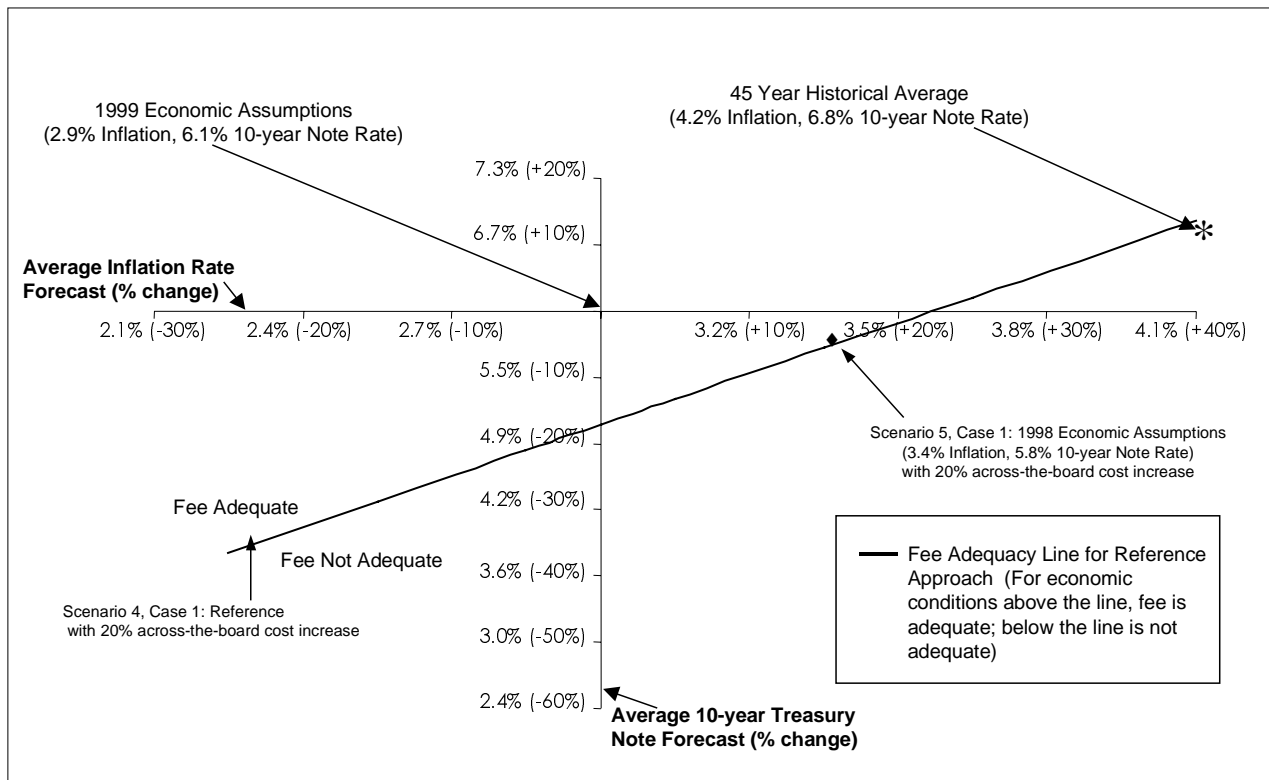


Figure 7. Case 1 Fee Adequacy: Sensitivity to Changes in Economic Assumptions for a 20 Percent Increase in Program Costs

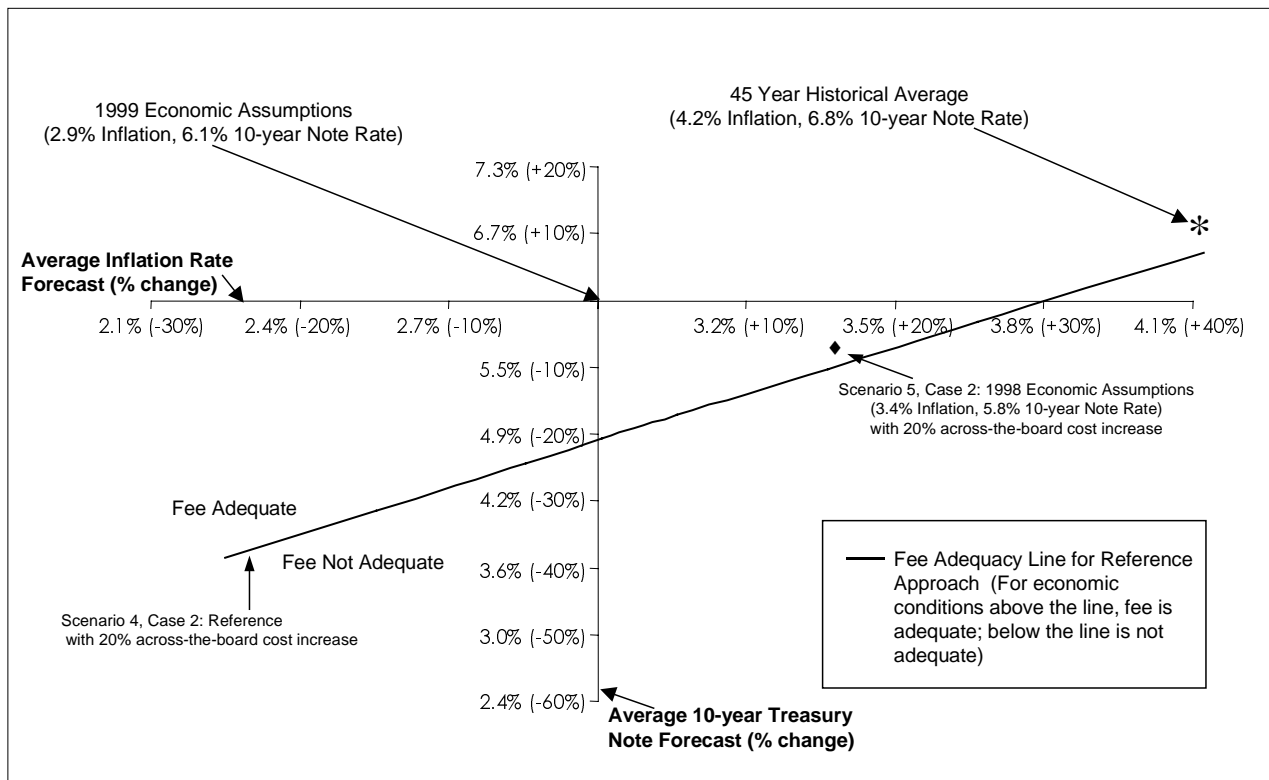


Figure 8. Case 2 Fee Adequacy: Sensitivity to Changes in Economic Assumptions for a 20 Percent Increase in Program Costs

Table 5. Detailed Nuclear Waste Fund Fee and Income Flows for Case 1 and Case 2 (Millions of YOE \$)

Fiscal Year	Fee Payments	One-Time Fee Payments	Income from Investing Case 1	Income from Investing Case 2
1999	660	0	590	590
2000	660	0	670	670
2001	660	0	700	700
2002	650	0	730	730
2003	650	0	770	770
2004	650	0	820	820
2005	650	0	860	860
2006	650	0	900	900
2007	640	0	940	950
2008	640	0	990	990
2009	640	0	1,030	1,030
2010	610	2,320	1,100	1,110
2011	590	610	1,320	1,320
2012	560	0	1,420	1,430
2013	520	910	1,530	1,540
2014	460	0	1,670	1,680
2015	410	50	1,770	1,790
2016	390	0	1,880	1,890
2017	360	0	2,000	2,010
2018	350	0	2,130	2,150
2019	350	0	2,270	2,290
2020	350	0	2,460	2,480
2021	330	0	2,640	2,660
2022	310	0	2,840	2,860
2023	260	0	3,020	3,040
2024	210	0	3,150	3,170
2025	150	670	3,270	3,300
2026	110	0	3,420	3,450
2027	60	0	3,400	3,440
2028	40	0	3,440	3,480
2029	30	0	3,460	3,500
2030	20	0	3,520	3,560
2031	10	0	3,510	3,550
2032	10	0	3,630	3,670
2033	10	0	3,740	3,780
2034	0	0	3,850	3,900
2035	0	0	3,960	4,010
2036	0	0	4,080	4,140
2037	0	0	4,210	4,270
2038	0	0	4,340	4,400
2039	0	0	4,480	4,550
2040	0	0	4,640	4,710
2041	0	0	4,840	4,910
2042	0	0	5,070	5,150
Total^a (99-42)	13,700	4,600	111,100	112,200

NOTES: ^aTotals may not add due to independent rounding. Fee revenues continue until 2036 (for 2030 through 2036 the fee is less than \$5M/yr and rounds to zero).

Table 6. Detailed Nuclear Waste Fund Cost Share for Case 1 and Case 2 (Millions of 1999\$)

Fiscal Year	Civilian Cost Share Case 1	Civilian Cost Share Case 2
1999	180	180
2000	260	260
2001	330	330
2002	220	220
2003	250	250
2004	260	260
2005	360	340
2006	610	600
2007	500	490
2008	450	430
2009	150	140
2010	260	260
2011	520	520
2012	600	600
2013	670	670
2014	660	660
2015	730	730
2016	740	740
2017	620	610
2018	610	610
2019	570	570
2020	570	570
2021	590	590
2022	560	560
2023	560	560
2024	570	560
2025	630	620
2026	630	620
2027	610	600
2028	610	600
2029	640	630
2030	660	650
2031	620	620
2032	650	650
2033	680	670
2034	690	690
2035	650	650
2036	640	640
2037	640	630
2038	580	580
2039	580	570
2040	490	490
2041	260	260
2042	140	140
Civilian Costs from 1999-2042	22,800	22,600
Civilian Cost after 2042	7,230	10,900
Total	30,030	33,500

4.4 FEE ADEQUACY ANALYSIS CONCLUSION

This assessment concludes that the 1.0 mill per kWh fee is sufficient at this time for Cases 1 and 2. However, future economic conditions may vary from the forecasts used in this analysis, and costs may vary due to future changes in program scope. This analysis used forecasted (CRMWS M&O 1999a) real interest rates that remained above the historical average for the entire analysis period. In the future the real interest rate forecast may decline toward its historical average.